COMPLEX SIGNAL DETECTING METHOD, COMPLEX MICROSCOPE AND COMPLEX DIFFRACTION DEVICE

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Abstract

PROBLEM TO BE SOLVED: To detect a complete complex signal by detecting a real number component microscopic image of a sample and an imaginary number component microscopic image by shifting a phase by &pi /2 on only the sample transmitted light, and taking the complex sum of these real number component microscopic image and imaginary number component microscopic image.
SOLUTION: First of all, the light passing through a sample is detected by using a lens system to measure a square of the amplitude, that is, an intensity value (energy per unit time and area). Next, a &pi /2 phase plate is arranged on the focal surface on the rear side of a lens to shift a phase by &pi /2 on only the 0 order diffracted light (the focus condensed light of the unscattered irradiating light) of this transmitted light. This transmitted irradiating light is mixed with the object light having an image signal at image forming time as a reference signal to detect an intensity value of the sum of both. The complex sum of a detecting intensity value (a real number component signal) of the front stage and a detecting intensity value (an imaginary component signal) of the rear stage is calculated to thus detect a complex signal composed of the real number component signal and the imaginary number component signal of a bright field image sample, that is, a sample original image.